

CLAIMS

1. A picture conversion apparatus that converts an inputted interlaced video signal into a progressive video
5 signal, comprising:

an interpolation circuit that generates interpolated pixels between lines on the basis of said inputted interlaced video signal;

a motion calculation circuit that calculates a motion
10 amount in the vertical direction of a picture on the basis of said interpolation signal outputted from said interpolation circuit;

a still picture processing circuit that generates a still picture progressive signal by still picture processing
15 from said inputted interlaced video signal;

a moving picture processing circuit that generates a moving picture progressive signal by moving picture processing from said inputted interlaced video signal; and

an output circuit that outputs the still picture
20 progressive signal outputted from said still picture processing circuit as said progressive video signal when said motion amount calculated by said motion calculation circuit is smaller than a first value.

25 2. The picture conversion apparatus according to claim

1, wherein

said interpolation circuit includes

an interlace generation circuit that generates a plurality of interlaced video signals respectively

5 corresponding to a plurality of successive fields on the basis of said inputted interlaced video signal,

a progressive generation circuit that generates a progressive signal on the basis of the plurality of interlaced video signals generated by said interlace generation circuit,

10 and

a pixel generation circuit that generates interpolated pixels between lines by interpolation processing using said progressive signal generated by said progressive generation circuit, and outputs an interpolation signal including pixels
15 in said progressive signal and the interpolated pixels, and

said motion calculation circuit calculates said motion amount on the basis of said interpolation signal outputted from said pixel generation circuit.

20 3. The picture conversion apparatus according to claim 2, wherein said first value is a value which is not more than the spacing between lines.

4. The picture conversion apparatus according to claim
25 2, wherein said motion calculation circuit calculates the

motion amount in the vertical direction on the basis of a value smaller than the spacing between lines.

5 5. The picture conversion apparatus according to claim
2, wherein

 said progressive generation circuit comprises

 a first progressive generation circuit that generates
a first progressive signal on the basis of a first combination
of more than one of the plurality of interlaced video signals
10 generated by said interlace generation circuit, and

 a second progressive generation circuit that generates
a second progressive signal on the basis of a second
combination, which differs from said first combination, of
more than one of the plurality of interlaced video signals
15 generated by said interlace generation circuit,

 said pixel generation circuit comprises

 a first pixel generation circuit that generates
interpolated pixels between lines by interpolation
processing using said first progressive signal generated by
20 said first progressive generation circuit to output a first
interpolation signal including the pixels in said first
progressive signal and the interpolated pixels, and

 a second pixel generation circuit that generates
interpolated pixels between lines by interpolation
25 processing using said second progressive signal generated by

said second progressive generation circuit to output a second interpolation signal including the pixels in said second progressive signal and the interpolated pixels, and

said motion calculation circuit calculates said motion
5 amount on the basis of said first interpolation signal
outputted from said first pixel generation circuit and said
second interpolation signal outputted from said second pixel
generation circuit.

10 6. The picture conversion apparatus according to claim
2, wherein said output circuit outputs said moving picture
progressive signal as said progressive video signal when said
motion amount is larger than a second value.

15 7. The picture conversion apparatus according to claim
6, wherein said output circuit synthesizes, when said motion
amount is between said first value and said second value, said
moving picture progressive signal and said still picture
progressive signal at a ratio based on said motion amount to
20 output the synthesized signal as said progressive video
signal.

8. The picture conversion apparatus according to claim
2, wherein said output circuit sets the ratio of said still
25 picture progressive signal to not less than 0.5 when said

motion amount is not more than the spacing between lines.

9. The picture conversion apparatus according to claim 2, wherein

5 said output circuit sets the ratio of said still picture progressive signal to not less than 0.5 when said motion amount is not more than 0.75 times the spacing between lines.

10 10. The picture conversion apparatus according to claim 2, wherein

 said output circuit sets the ratio of said still picture progressive signal to not less than 0.5 when said motion amount is not more than 0.5 times the spacing between lines.

15 11. The picture conversion apparatus according to claim 5, wherein

 said plurality of interlaced video signals include first to fourth interlaced video signals corresponding to successive first to fourth fields,

20 said first combination of more than one of the plurality of interlaced video signals include said first to third interlaced video signals, and

 said second combination of more than one of the plurality of interlaced video signals include said second to 25 fourth interlaced video signals.

12. The picture conversion apparatus according to claim 2, further comprising

a judgment circuit that respectively calculates the averages of the values of object pixels and pixels peripheral thereto in the plurality of interlaced video signals corresponding to the plurality of fields, and judges whether said still picture progressive signal is adaptive or non-adaptive on the basis of said calculated averages, said output circuit outputting the moving picture progressive signal as said progressive video signal when the result of the judgment by said judgment circuit is non-adaptive.

13. The picture conversion apparatus according to claim 12, wherein

said judgment circuit respectively calculates the maximums and the minimums of the values of the object pixels and the pixels peripheral thereto in the plurality of interlaced video signals corresponding to said plurality of fields to judge whether said still picture progressive signal is adaptive or non-adaptive on the basis of said calculated averages, maximums, and minimums.

14. The picture conversion apparatus according to claim

12, wherein

said judgment circuit judges whether said still picture progressive signal to be non-adaptive when the respective differences between the calculated averages are larger than
5 a predetermined value, and the difference between the maximum and the minimum in the same field is smaller than the predetermined value.

15. A picture conversion method in which an inputted
10 interlaced video signal is converted into a progressive video signal, comprising the steps of:

generating interpolated pixels between lines, and
outputting an interpolation signal including the
interpolated pixels;

15 calculating a motion amount in the vertical direction of a picture on the basis of the outputted interpolation signal;

generating a still picture progressive signal by still
picture processing from said inputted interlaced video
20 signal;

generating a moving picture progressive signal by
moving picture processing from said inputted interlaced video
signal; and

outputting said outputted still picture progressive
25 signal as said progressive video signal when said calculated

motion amount is smaller than a first value.

16. The picture conversion method according to claim 15, wherein

5 said step of generating interpolated pixels includes the steps of

 generating a plurality of interlaced video signals respectively corresponding to a plurality of successive fields on the basis of said inputted interlaced video signal,

10 generating a progressive signal on the basis of the generated plurality of interlaced video signals, and

 generating interpolated pixels between lines by interpolation processing using said generated progressive signal, and outputting an interpolation signal including
15 pixels in said progressive signal and the interpolated pixels, and

 said step of calculating a motion amount includes the step of

 calculating said motion amount on the basis of the
20 outputted interpolation signal.